

Course Unit	Programming II		Field of study	Informatics	
Bachelor in	Electrical and Computers Engineering		School	School of Technology and Management	
Academic Year	2021/2022	Year of study	1	Level	1-1
Type	Semestral	Semester	2	ECTS credits	6.0
			Code	9112-742-1205-00-21	
Workload (hours)	162	Contact hours	T 30	TP -	PL 30
			TC -	S -	E -
			OT -	O -	

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s) Pedro João Soares Rodrigues, Adília Isabel Domingues Cruz Alves

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:

1. Structure a rationale that allows you to outline a solution and build complex programs in Python
2. Apply knowledge in the Python language, with object-oriented programming (POO), database and graphical interfaces on desktop and WEB.

Prerequisites

Before the course unit the learner is expected to be able to:

To know the algorithmic bases and programming bases in Python.

Course contents

Object-oriented programming in Python. Classes, objects, members, constructors, and inheritance. Introduction to databases. Database modelling and normalization. ER diagrams. Python database. Introduction to graphical interfaces in Python. Use of Tkinter to create application interfaces. Web interfaces. Use of flask, html, and css to create web interfaces. The numpy library in support of engineering problems. Matplotlib

Course contents (extended version)

1. Object-oriented programming.
 - Classes, objects and constructors
 - Capsulation
 - Access to class members
 - Inheritance
 - Abstraction
 - Polymorphism
 - Class diagram
2. Databases
 - ER diagrams
 - Modelation
 - Table normalization
 - Usage of python with databases
3. Graphical interfaces
 - Window components
 - Layout
 - Use of Tkinter to create application interfaces
4. WEB interfaces
 - HTML
 - CSS
 - Flask - backend
 - Jinja templates
5. The numpy library in support of engineering problems
6. Matplotlib

Recommended reading

1. Charles Severance, Sue Blumenberg, et al., " Python for Everybody: Exploring Data in Python 3", Independently published, 2020
2. Adelaide Carvalho, "PRÁTICAS DE PYTHON - ALGORITMIA E PROGRAMAÇÃO", FCA, 2021
3. Ernesto Costa, "PROGRAMAÇÃO EM PYTHON - FUNDAMENTOS E RESOLUÇÃO DE PROBLEMAS", FCA, 2015

Teaching and learning methods

The teaching method used in lecture classes is the expository method, which makes possible the transmission of knowledge in a continuous and less time consuming manner. Practical classes are mostly based on the active method, enhancing the activity of students through the resolution of practical exercises. Students are also required to perform practical assignments outside the classes.

Assessment methods

1. Alternative 1 - (Regular, Student Worker) (Final)
 - Intermediate Written Test - 20%
 - Intermediate Written Test - 20%
 - Final Written Exam - 60%
2. Alternative 2 - (Regular, Student Worker) (Final, Supplementary, Special)
 - Final Written Exam - 100%

Language of instruction

Portuguese

Electronic validation

Pedro João Soares Rodrigues	José Luís Padrão Exposto	Orlando Manuel de Castro Ferreira Soares	Paulo Alexandre Vara Alves
07-03-2022	12-03-2022	21-03-2022	22-03-2022